

What is claimed is:

1. A digital signal processing device comprising:

    multiplication means for multiplying an input  $\Delta\Sigma$  modulation signal generated from  $\Delta\Sigma$  modulation by a factor;

$\Delta\Sigma$  modulation means having a plurality of integrators for varying effective orders and applying  $\Delta\Sigma$  modulation again to an output from said multiplication means; and

    switchover means for switching between a reprocessed  $\Delta\Sigma$  modulation signal from said  $\Delta\Sigma$  modulation means and said input  $\Delta\Sigma$  modulation signal.

2. The digital signal processing device according to claim 1, wherein said  $\Delta\Sigma$  modulation means comprises order control means for varying effective orders depending on signal switchover situations in said switchover means.

3. The digital signal processing device according to claim 2, wherein said order control means varies effective orders for said  $\Delta\Sigma$  modulation means at an approximate timing when said switchover means switches between said input  $\Delta\Sigma$  modulation signal and said reprocessed  $\Delta\Sigma$  modulation signal.

4. The digital signal processing device according to claim 2, wherein said order control means varies effective orders for said  $\Delta\Sigma$  modulation means at an approximate timing when said switchover means switches between a fixed signal changing to no sound in an audible band and music data processed with  $\Delta\Sigma$  modulation.

5. The digital signal processing device according to claim 1, wherein said  $\Delta\Sigma$  modulation means comprises fraction elimination means for eliminating a fraction remaining in said integrator.

6. A digital signal processing method, comprising steps of:

    a multiplication step for multiplying an input  $\Delta\Sigma$  modulation signal generated from  $\Delta\Sigma$  modulation by a specified factor for specified processing;

    a reprocessed  $\Delta\Sigma$  modulation step for reapplying  $\Delta\Sigma$  modulation to an output provided with said specified processing by using a  $\Delta\Sigma$  modulator comprising a plurality of integrators for varying effective orders; and

    a switchover step for switching between said input  $\Delta\Sigma$  modulation signal and said reprocessed  $\Delta\Sigma$  modulation signal.

7. The digital signal processing method according to claim 6, wherein said reprocessed  $\Delta\Sigma$  modulation step varies effective orders for said  $\Delta\Sigma$  modulator depending on signal switchover situations in said switchover step.

8. The digital signal processing method according to claim 7, wherein said reprocessed  $\Delta\Sigma$  modulation step varies effective orders for said  $\Delta\Sigma$  modulator at an approximate timing when said switchover step switches between said input  $\Delta\Sigma$  modulation signal and said reprocessed  $\Delta\Sigma$  modulation signal.

9. The digital signal processing method according to claim 7, wherein said reprocessed  $\Delta\Sigma$  modulation step varies effective orders for said  $\Delta\Sigma$  modulator at an

approximate timing when said switchover step switches between a fixed signal changing to no sound in an audible band and music data processed with  $\Delta\Sigma$  modulation.

10. The digital signal processing method according to claim 6, wherein said reprocessed  $\Delta\Sigma$  modulation step not only varies effective orders for a  $\Delta\Sigma$  modulator, but also eliminates a fraction remaining in said integrator.

11. A  $\Delta\Sigma$  modulator for applying  $\Delta\Sigma$  modulation to a multi-bit signal comprising:  
a plurality of integrators; and

order variation means for varying effective orders increasing due to connection with a plurality of said integrators.

12. The  $\Delta\Sigma$  modulator according to claim 11, wherein the fraction elimination means for eliminating a fraction remaining in said integrator.